surrounding plates 1 and 2. Reference number 9 designating an unknown part is changed to reference number 22 designating attachment holes attaching outer ring 21 to lid 7. Reference numbers 13 and 10 are changed to 20 and 24 to designate cooling channels, and holes in lower plate 2 respectively. Reference numbers 18, 21, and 25 are added to designate attachment bolts attaching lid 7 to upper plate 1, outer ring surrounding outer ring 8, and holes in protective plate 3 corresponding to holes 24 respectively. The corrected Fig. 1 uses numbering consistent with the description in the specification, and so adds no new matter.

Claims 1, 8-9 and 14 stand rejected under 35 U.S.C. §102(b) as being anticipated by Frankel et al. (USP 6,019,848). Claims 2-4, 6 and 16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Frankel in view of Tomoyasu et al. (USP 5,888,907). Claims 5, 7 and 14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Frankel in view of Hillman (USP 5,997,649). Claim 10 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Frankel in view of Vukelic (USP 5,268,034). Applicants respectfully traverse the prior art rejections, and request reconsideration and allowance of these claims in view of the following arguments.

The Examiner asserts that Frankel teaches the plasma reactor electrode recited in the claims of the present application. The Examiner refers to Figs. 2, 4 and 5; column 24, lines 43-63; column 26, lines 30-38; and column 27, lines 24-63 of Frankel. Applicants respectfully disagree.

Briefly, claim 1 of the present application recites a plasma reactor electrode comprising an upper plate and a lower plate for the transfer of RF energy, and a plurality of pins connecting the upper and lower plates to facilitate thermal conductivity during RF energy transfer. However, the parts of Frankel which the Examiner cites disclose a thermal chemical vapor deposition (CVD) apparatus, instead of a plasma CVD apparatus, and do not teach RF energy transfer through an

upper and a lower plate. Frankel also does not teach the provision of pins between upper and lower plate to facilitate thermal conductivity during RF energy transfer. There is nothing in the Frankel that inherently or otherwise provides such disclosure. As a result, Applicants respectfully believe the Examiner's rejection to be in error.

More specifically, the enclosure assembly 200 shown in Fig. 2 of Frankel includes an outer lid assembly 225 for delivering process and clean gases through an inlet tube 43 to an inner lid assembly 230. The inner lid assembly 230 functions to disperse the gases throughout a chamber 15 onto a wafer supported on a heater 25 (Frankel, col. 24, lines 46-51). As shown in Figs. 2, 4 and 5 of Frankel, the inner lid assembly 230 includes a base plate 265, a blocker or gas dispersion plate 301, and a showerhead or gas distribution plate 20 for dispersing process and clean gases into chamber 15 (Frankel, col. 27, lines 24-27). The gas dispersion plate 301 and the gas distribution plate 20 are affixed to lower surface of base plate 265 with a plurality of threaded mounting screws 303 and 305 (Frankel, col. 27, lines 40-43).

The Examiner asserts that the gas dispersion plate 301, the gas distribution plate 20 and mounting screws 303 and 305 of the Frankel assembly correspond to the recited upper plate, lower plate and a plurality of pins of the present application respectively. Applicants respectfully disagree. Plates 301 and 20 of the Frankel assembly are used for gas dispersion and gas distribution respectively, not for RF energy transfer. There is nothing in this structure that inherently or otherwise discloses, teaches, or suggests RF energy transfer. Therefore, there is nothing in Frankel which reasonably would equate the gas dispersion plate 301 to an upper plate, or the gas distribution plate 20 to a lower plate, as claimed.

In addition, mounting screws 303 and 305 of the Frankel assembly do nothing but hold plates 301 and 20 to the base plate 265. These mounting screws do nothing, whether inherently or otherwise, relative to thermal conductivity during RF energy transfer. Therefore, there is nothing in Frankel which reasonably would equate the mounting screws to the claimed pins.

In addition, as described in Frankel, in a thermal CVD process, reactive gases are supplied to the substrate surface where heat-induced chemical reactions take place to produce a desired film. In contrast, in a plasma process, a controlled plasma is formed to decompose and/or energize reactive species to produce the desired film (Frankel, col. 2, lines 30-37). Ordinary skilled artisans would appreciate that Figs. 2, 4, and 5 of Frankel illustrate a thermal CVD apparatus; that the parts of the Frankel specification that the Examiner has cited describe a thermal CVD apparatus; and that no RF energy transfer is involved. By asserting that Frankel teaches the plasma reactor electrode of the present application, the Examiner has read the limitations about RF energy transfer out of the claims. Such an approach is improper.

Frankel's context confirms that the Frankel apparatus is for a thermal CVD process, not for a plasma CVD process. Frankel states that, for the plasma process, the described CVD apparatus would have to include a gas feed-through box housing gas passages 83 and 85 to enable the application of high voltage RF power to the gas box without gas breakdown, and without gas deposition in the gas distribution system (Frankel, col. 27, lines 30-35). In addition, Frankel states that, for a plasma process, the disclosed apparatus also need to include an isolator that electrically insulates the chamber lid from ground and isolates the chamber body from the RF gas box (Frankel, col. 28, lines 41-44). Moreover, Frankel does not describe the lid assembly for use with RF plasma processes, but incorporates Wang (USP 4,872,947) by reference.

Because Frankel refers to this additional structure in the event of application to a plasma CVD process rather than to a thermal CVD process, it is believed clear that none of the Frankel structure to which the Examiner has pointed could possibly have anything to do with RF energy transfer, nor with facilitating thermal conductivity during RF energy transfer.

Looking more closely at Wang, as shown in Wang Figs. 2, 10 and 12, a plasma-enhanced CVD reactor system 10 comprises an inner chamber 13 that has a plasma processing region 14; a process gas manifold or box 26 that applies process gas to the chamber 13; an RF/gas feed-through device 36 that supplies process gas to the RF-driven gas manifold 26; and an RF power supply and matching network 28 for creating and sustaining a process gas plasma from the inlet gas. The RF/gas feed-through 36 applies RF power to the gas box 26 and uses the gas box 26 as the powered RF electrode to prevent breakdown of the process gas and deposition within the gas distribution system (Wang, col. 14, lines 31-35).

Thus, although Wang is directed to a plasma CVD process, Wang does not teach or suggest the recited upper and lower plates for RF energy transfer, connected by a plurality of pins which facilitate thermal conductivity during RF energy transfer.

Pursuant to the foregoing, Applicants respectfully submit that Frankel, with Wang incorporated therein, does not teach or suggest the recited upper and lower plates for RF energy transfer, and a plurality of pins connecting the upper and lower plates to facilitate thermal conductivity during RF energy transfer. Therefore, claim 1 and all of its dependent claims, including claims 2-10, are patentable.

For the same reasons, Applicants submit that claim 14 and its dependent claims 15-16 are patentable.

Applied Docket No. 005651 USA/ETCH/CHMBR/JB1
PATENT APPLICATION

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 09/834,343

The Examiner's rejections having been overcome, Applicants submit that the subject application is in condition for allowance. The Examiner is respectfully requested to contact the undersigned at the telephone number listed below to discuss other changes deemed necessary. Applicants hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,

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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this AMENDMENT UNDER 37 C.F.R. § 1.111 is being facsimile transmitted to the U.S. Patent and Trademark Office this 5th day of March, 2003.

Thea K. Wagner